

# THE JURASSIC DINOSAUR *SCOLIDOSAURUS HARRISONI*, OWEN

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ABSTRACT. *Scelidosaurus harrisoni* Owen, the type species of the genus, is reconsidered using all available material. Evidence is given that the lectotype chosen by Lydekker is unsuitable, as it is a megalosaur, not an ornithischian, and it is proposed to make an application to the International Nomenclature Commission to designate an alternative specimen.

UNTIL the recent discovery in the Upper Trias of South Africa of *Heterodontosaurus* (Crompton and Charig 1962), *Scelidosaurus* was the earliest recorded ornithischian dinosaur of which we had adequate knowledge. *Scelidosaurus* comes from the Lower Lias of Charmouth, Dorset and is not only the earliest member of the group recorded from the northern hemisphere but its skeleton is the first to be known with any degree of completeness. The genus includes but a single species and is generally accepted as a member of the Sub-order Stegosauria. Specimens referred with the prefixes BM or GSM are respectively in the British Museum (N.H.) or the Geological Survey Museum London.

## SYSTEMATIC DESCRIPTION

Genus *SCOLIDOSAURUS* Owen, 1861

*Scelidosaurus harrisoni* Owen

Plates 7, 8

- 1859 *Scelidosaurus* Owen, p. 150 *nomen nudum*.
- 1860 *Scelidosaurus* Owen, p. 258 *nomen nudum*.
- 1861 *Scelidosaurus harrisoni* Owen, p. 1, pls. I–VI.
- 1863 *Scelidosaurus harrisoni* Owen; Owen, p. 1, pls. I–XI.
- 1888 *Scelidosaurus harrisoni* Owen; Lydekker, p. 181.
- 1890 *Scelidosaurus harrisoni* Owen; Woodward and Sherborn, p. 283.

*Lectotype*. (BM 39496), a right knee-joint, designated by Lydekker (1888, p. 181).

*Paratypes*. A skull and skeleton (BM R1111): a femur, tibia, fibula and phalanges with a vertebral centrum of a juvenile individual (Lyme Regis Museum): an imperfect left femur, GSM 109660 and a terminal phalange GSM 109561. All are from the lower Lias of Charmouth, Dorset.

The name *Scelidosaurus* was introduced in 1859 by Owen for 'a saurian with large hollow limb-bones, with the femur, having the third inner trochanter, and with metacarpal and phalangeal bones adapted for movement on land' but it was not until 1861 that Owen gave the first valid description of *Scelidosaurus*, using the trivial name *harrisoni*. He described the left femur of one individual, the knee-joint of another, together with a phalange of a third and a femur, tibia, fibula, and phalanges with a centrum of a dorsal vertebra of a fourth, younger animal. Owen also described the skull of a further individual, of which the rest of the skeleton was discovered on further

excavation, and described in 1863. All reconstructions of *Scelidosaurus harrisoni* and ideas as to its appearance and mode of locomotion have been founded entirely on this last specimen (Pl. 7, fig. 1).

Lydekker (1889) was under the impression that the knee-joint was the type and designated it as such. This subsequent designation gave the knee-joint the status of lectotype whilst the other specimens described in the same paper became paratypes. The additional material of the same individual whose skull had been described may also be considered as a paratype. Later Woodward and Sherborn (1890, p. 283) listed the knee-joint as the type of *Scelidosaurus harrisoni* (Pl. 7, fig. 2).

*Description of the type material.* An initial examination of the type material indicated that the lectotype (BM 39496), possessed characteristics similar to those of the knee-joint of a bipedal, carnivorous dinosaur. Development of this specimen with acetic acid has confirmed this and it appears to be the knee-joint of a megalosaurid.

Of the remainder of Owen's type material, detailed examination has shown that the right femur, tibia, fibula, phalanges, and vertebral centrum of the juvenile individual, all in the Lyme Regis Museum, probably belong to the genus *Hypsilophodon* or some allied form and in any case are not of the same species as the knee-joint, or the pyrite-coated femur, described by Owen in the same paper, the latter specimen also being part of a megalosaurid. The phalange mentioned and figured by Owen in the same paper is possibly also of a megalosaurid.

The skull (R1111) which Owen described with the above material is definitely that of an ornithischian dinosaur, and this with the remainder of the associated skeleton, is the material usually brought to mind when referring to *Scelidosaurus* (see Pl. 7, fig. 1).

*Knee-joint.* The specimen (BM 39496) comprises the distal end of the femur with the proximal end of the tibia and fibula (Pl. 7, fig. 2). When the femur was compared with that of an undoubted *Megalosaurus bucklandi* (BM 31806) it appeared to be closely similar, (Pl. 8, figs. 1, 5, 6, 8, 9). On the other hand when compared with the femur of the complete skeleton (BM R1111) it showed little if any similarity (Pl. 8, figs. 1, 5, 2, 7) and is, moreover, very much bigger. The popliteal cavity in both the femur of the knee-joint and the femur of *M. bucklandi* has steep straight sides, parallel throughout their length. On the other hand the popliteal cavity in the femur of the skeleton has sides which slope gently to its floor and are wide apart at the distal end, but gradually converge upwards to meet at the proximal end of the cavity forming an arcuate shape. The outer condyle of the femur in the skeleton is quite different in shape from that of either the knee-joint or *M. bucklandi*, its angle to the main shaft of the femur being about 45°, whereas in the two latter the angle is about 90° (Pl. 8, figs. 1, 2, 5-9).

The tibia of the knee-joint compares closely with that of *M. bucklandi* (BM 31809), particularly in the longitudinal expansion of the proximal end of the bone when viewed externally. The proximal aspect of these two specimens also shows a marked similarity in the shape of the condyles and the forward extension of that part of the bone supporting the procnemial and ectocnemial crests. Comparison of these specimens with the tibia of the skeleton in posterior view shows that the condyles of the latter are relatively smaller, with a larger space between them, whilst the articular surfaces are somewhat flattened, contrasting strongly with the deep, rounded condyles of the other two (Pl. 8, figs. 3, 4, 10-13).

*Left femur.* This isolated left femur (GSM 109560), one of the paratypes described by Owen, also appears to be that of a megalosaurid, though probably of an immature animal, and when compared with *M. bucklandi* (BM 31806) shows several similar features (Pl. 7, fig. 3a–b). The distal and proximal ends of the femur have been restored by the writer and the bone is figured for comparison with a right femur of *M. bucklandi*. The restored areas are indicated by white lines on the Geological Survey specimen, and similar white lines have been painted in corresponding positions on BM 31806.

*Terminal phalange.* The phalange (GSM 109561) mentioned and figured by Owen (1861, p. 5, pl. 2) is possibly the terminal phalange of the first digit of a megalosaurian. Comparison of this specimen with the terminal phalanges of the ornithischian skeleton, R1111, showed that whilst the latter are spatulate and hoof-like, the former is claw-like as in *Megalosaurus* and cannot belong to the same species.

*Juvenile specimen.* The bones of the young individual in the Lyme Regis Museum described by Owen (1861) do not belong to a megalosaurid but are certainly ornithischian possibly related to the Wealden genus *Hypsilophodon*. Comparison with the skeleton (R1111) suggests they are not of the same species but definite opinion must await the development of the skeleton with acid so that the relevant bones may be examined more fully.

#### DISCUSSION

Since it is now clear that, in his original description of *Scelidosaurus harrisoni*, Owen was dealing with more than one genus, the name should be reserved for that part of the material which is an undoubted ornithischian skeleton. On this basis the skull (BM R1111), together with its associated skeleton, should be the lectotype. Unfortunately, as already pointed out, Lydekker (1889) chose the knee-joint, (BM 39496), as lectotype and was supported in this by Woodward and Sherborn (1890). Consequently an application is to be made to the International Commission on Zoological Nomenclature to set aside Lydekker's selection, and designate BM R1111 as the type of *Scelidosaurus harrisoni*.

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#### EXPLANATION OF PLATE 7

Fig. 1. A complete skeleton of an ornithischian dinosaur, '*Scelidosaurus harrisoni*' left side view. BM R1111.

Fig. 2. A knee joint, lectotype of *Scelidosaurus harrisoni*. BM 39496.

Fig. 3. (a) Posterior view of right femur of *Megalosaurus bucklandi* BM 31806, compared with (b) that of the left femur of an unnamed megalosaurid, GSM 109560.

#### EXPLANATION OF PLATE 8

Figs. 1, 5, 8. External, posterior and terminal views of distal end of right femur of the lectotype of '*Scelidosaurus harrisoni*', BM 39496.

Figs. 2, 7, 11. External and posterior views of distal half of right femur and posterior view of right knee joint of skeleton of an ornithischian dinosaur, BM R1111.

Figs. 3, 12. Terminal and internal views of proximal end of left tibia of *Megalosaurus bucklandi*, BM 31809.

Figs. 4, 10, 13. Internal, posterior and terminal views of right tibia of lectotype of '*Scelidosaurus harrisoni*', BM 39496.

Figs. 6, 9. Posterior and terminal views of distal end of right femur of *Megalosaurus bucklandi*, BM 31806.

